

REMARKS

Claims 1-10 were objected to in view of various informalities. The claims have been amended above to address the examiner's concerns.

Claims 1-2 and 4-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lang (WO 99/08597), in view of Malicki et al. (US 4,918,375), Amerena (US 4,860,753), and Zhao (US 5,833,686). Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lang (WO 99/08597), in view of Malicki et al. (US 4,918,375), Amerena (US 4,860,753), Zhao (US 5,833,686), and Sherwin (US 4,640,290). The examiner is requested to reconsider these rejections.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Claims 1 and 7 recite, *inter alia*, "an electromagnetic probe ... placed on the skin during the measurement ... the capacitance of the probe is proportional to the dielectric constant of the skin and the subcutaneous fat tissue, which is further proportional to the water content of the skin, ... measuring the capacitance of the electromagnetic probe at a high frequency, approximately 20-500 MHz".

In contrast, Lang merely discloses a method and an apparatus for measuring capillary related interstitial fluid on human tissue using an ultrasound technique. Lang teaches of tissue fluid and edema, and its detection using the ultrasound

method. However, there is no mention in Lang of using electromagnetic methods to detect edema. Additionally, Lang does not teach or disclose the electromagnetic, and to be more specific, dielectric method in combination with a coaxial probe at frequencies of 20-500 MHz. Moreover, the ultrasound technique itself is a fundamentally different technique, involving different physical phenomena (high frequency vibrations for ultrasound, versus magnetism developed by a current of electricity for electromagnetic), than the electromagnetic technique used in applicants' claimed invention.

Also in contrast, Malicki merely discloses a method to measure water content of soil. Malicki teaches that there is a known relationship between the dielectric constant of a material and its water constant, and that the calculation of said water content can be based upon the relative changes of the capacitance of an electromagnetic probe. However, Malicki does not disclose or specify the frequency used for the electromagnetic field. Additionally, Malicki discloses a dielectric method that is not applicable for skin or tissue measurements since the dimensions of the probe waveguides 1a, 1b, 1c are 0.1 m, 0.25 m, and 0.50 m, respectively (see col. 6, lines 67-68) and thus too large for use on skin. Furthermore, the measurement of the dielectric constant is based on measuring the velocity wave propagation as opposed to a proportion of the capacitance of the probe as in applicants' claimed invention.

Also in contrast, Amerena merely discloses a monitoring apparatus comprising a probe to measure skin surface moisture

content using a capacitive method. In particular, Amerena teaches a monitoring apparatus for measuring the moisture content of skin in the area of the probe tip (see col. 3, lines 31-22), such as the upper layers of human skin including the stratum corneum (see col. 1, lines 7-8). Amerena provides no teaching or suggestion to measure or detect the moisture content of deeper skin structures within the dermis such as underlying subcutaneous fat tissue. Additionally, Amerena discloses that the used frequency of the apparatus is on the order of 25 kilohertz (col. 3, lines 42-43 and claim 6), which is a considerably lower frequency range than the 20-500 MHz of applicants' claimed invention.

Also in contrast, Zhao merely discloses a surgical cosmetic treatment apparatus for removing benign skin growths. The apparatus in Zhao does not teach or suggest an apparatus having the function or capability to measure tissue edema or any other parameter. Additionally, Zhao does not disclose any information about the effective depth of the treatment.

Neither Lang, Malicki, Amerena, or Zhao teach or suggest an electromagnetic probe placed on the skin during the measurement, wherein the capacitance of the probe is proportional to the dielectric constant of the skin and the subcutaneous fat tissue, which is further proportional to the water content of the skin, and measuring the capacitance of the electromagnetic probe at a high frequency, approximately 20-500 MHz as claimed in applicant's claimed invention.

Applicants submit that the proposed combination of Lang in view of Malicki, Amerena, and Zhao would render a method and

apparatus comprising an ultrasonic probe placed on the skin for measuring capillary related interstitial fluid which utilizes a dielectric method not fit for use on skin or tissue (thus rendering the dielectric method inoperable), and for measuring the water content on the surface of the skin. As opposed to applicant's claimed invention having an electromagnetic probe placed on the skin during the measurement, and the capacitance of the probe is proportional to the dielectric constant of the skin and the subcutaneous fat tissue, which is further proportional to the water content of the skin, and measuring the capacitance of the electromagnetic probe at a high frequency, approximately 20-500 MHz.

Furthermore, applicants submit that there is no suggestion to combine the references as the examiner is attempting to do (at least not until after reading applicants' patent application). In particular, Lang teaches a method and an apparatus for measuring capillary related interstitial fluid on human tissue using an ultrasound technique (as opposed to measuring tissue edema using an electromagnetic probe).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. (see MPEP 2143.01, page 2100-98, column 1). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination (see

MPEP 2143.01, page 2100-98, column 2). A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is **not sufficient** to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. (see MPEP 2143.01, page 2100-99, column 1) Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). >See also Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.)

In the present case, there is no teaching, suggestion, or motivation, found in either the references themselves or in the knowledge generally available to one of ordinary skill in the art, to provide an electromagnetic probe placed on the skin during the measurement, the capacitance of the probe is proportional to the dielectric constant of the skin and the subcutaneous fat tissue, which is further proportional to the water content of the skin, and measuring the capacitance of the electromagnetic probe at a high frequency, approximately 20-500 MHz" as claimed in claims 1 and 7. The features of claims 1 and 7 are not disclosed or suggested in the art of record. Therefore, claims 1 and 7 are patentable and should be allowed.

Claims 2-6 and 8-10 depend from claims 1 and 7, respectively, and thus include all the limitations of claims 1 and 7.

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Therefore, claims 2-6 and 8-10 are believed to be allowable for at least the reasons given for claims 1 and 7.

Claim 11 has been added above to further claim the features recited therein.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issue remain, the examiner is invited to call applicants' attorney at the telephone number indicated below.

Respectfully submitted,

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1/19/07  
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